

**Translation**

**PATENT COOPERATION TREATY**

**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>FTA0402-PCT</b>	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. <b>PCT/JP2004/008445</b>	International filing date (day/month/year) <b>16.06.2004</b>	Priority date (day/month/year) <b>17.06.2003</b>
International Patent Classification (IPC) or national classification and IPC		
Applicant <b>KABUSHIKI KAISHA TOSHIBA</b>		

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>8</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>																									
<p>4. This report contains indications relating to the following items:</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>		<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input checked="" type="checkbox"/>	Box No. VII	Certain defects in the international application	<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_ which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
  - ☐ publication of the international application (Rule 12.4)
  - ☐ international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

- ☒ the international application as originally filed/furnished
- ☐ the description:

pages \_\_\_\_\_ as originally filed/furnished

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

- ☐ the claims:

nos. \_\_\_\_\_ as originally filed/furnished

nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19

nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

- ☐ the drawings:

sheets \_\_\_\_\_ as originally filed/furnished

sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages \_\_\_\_\_

☐ the claims, nos. \_\_\_\_\_

☐ the drawings, sheets/figs \_\_\_\_\_

☐ the sequence listing (*specify*): \_\_\_\_\_

☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages \_\_\_\_\_

☐ the claims, nos. \_\_\_\_\_

☐ the drawings, sheets/figs \_\_\_\_\_

☐ the sequence listing (*specify*): \_\_\_\_\_

☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	1-19	YES
	Claims		NO
Inventive step (IS)	Claims	2-5, 11	YES
	Claims	1, 6-10, 12-19	NO
Industrial applicability (IA)	Claims	1-19	YES
	Claims		NO
2. Citations and explanations (Rule 70.7)			
<p>Document 1: WO 03/042686 A1 (Toshiba Corp.), 22 May 2003, entire text and fig. 1 to 12 &amp; JP 2003-149213 A &amp; US 2004/0024320 A1</p> <p>Document 2: Satoshi NAGAI et al., "Ekitai Kinzoku Reikyaku Genshiryoku Plant no Ronai Mokushika Gijitsu no Kaihatsu," Thermal and Nuclear Power, 15 August 1996, Vol. 47, No. 8, pages 846 to 852</p> <p>Document 3: JP 2002-48867 A (Mitsubishi Heavy Industries, Ltd.), 15 February 2002, entire text and fig. 1 to 6</p> <p>Document 4: JP 6-102258 A (Kawasaki Heavy Industries, Ltd.), 15 April 1994, entire text and fig. 1 to 7 &amp; WO 92/018862 A1 &amp; US 5475613 A</p> <p>Document 5: JP 6-294779 A (Hitachi Construction Machinery Co., Ltd.), 21 October 1994, entire text and fig. 1 to 4</p> <p>Document 6: JP 11-118775 A (Canon Inc.), 30 April 1999, entire text and fig. 1 to 5</p> <p>Document 7: JP 10-62396 A (Furuno Electric Co., Ltd.), 06 March 1998, entire text and fig. 1 to 21</p>			

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Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

Claims 1, 10, 12, 14 and 15

Documents 1 and 2 disclose three-dimensional ultrasonic imaging devices equipped with an ultrasonic transducer comprising a plurality of voltage oscillation elements that are disposed in a matrix array; a mechanical drive means for driving the ultrasonic transducer; an oscillation element selection unit; a detection circuit for detecting the echo signals that are reflected from the object to be examined via a liquid or solid acoustic medium; a signal processing unit for generating three dimensional imaging data by means of an aperture synthesis process; and an image processing unit for displaying a three-dimensional image that corresponds to the values from the three-dimensional imaging data. In addition, document 3 discloses an acoustic inspection device wherein the strength values of the reflected echo signals are multiplied by factors that are set according to the inspection position coordinates in order to correct said strength values; therefore, it can be considered to have been easy for a person skilled in the art to conceive of employing the technique for correcting the strengths of the reflected echo signals which is taught in document 3 in the three-dimensional ultrasonic imaging devices that are disclosed in documents 1 and 2.

Claims 2 to 5

The feature of examining the three-dimensional imaging data from three mutually orthogonal directions and then projecting the data that has the largest value upon a flat surface in order to generate three planar images that correspond to each of the directions is not disclosed in any of the documents that are cited in the

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
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international search report, and would not have been obvious to a person skilled in the art.

Claims 6 and 8

Ultrasonic inspection devices which display the profile of the object to be inspected while superposing inspection data thereupon for display are well known, as disclosed in documents 4 and 5.

Claims 7 and 9

Document 6 discloses an ultrasonic inspection device which calculates the surface area ratio of the pixels corresponding to the reflected ultrasonic signal data that has a prescribed level or higher, and then determines that there is an anomaly in cases when the calculated value exceeds a prescribed value; therefore, it can be considered to have been easy for a person skilled in the art to conceive of making a similar determination by means of the three-dimensional ultrasonic imaging devices that are disclosed in documents 1 and 2.

Claim 11

A three-dimensional ultrasonic imaging device wherein the effects of the ultrasonic waves that are reflected by the protrusions and recesses around the periphery of the object to be inspected are eliminated by covering the object to be inspected by means of a mask part with an opening that accommodates the scope of the inspection range is not disclosed in any of the documents that are cited in the international search report, and would not have been obvious to a person skilled in the

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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art.

Claim 13

The fact that it is possible to obtain a three-dimensional ultrasonic image even when using an ultrasonic transducer in which the plurality of voltage oscillation elements have been disposed in a single row is well known, as disclosed in document 7.

Claims 16 to 19

A person skilled in the art could have configured the ultrasonic imaging devices that are disclosed in documents 1 and 2 so as to inspect objects with a layered structure that have planar boundaries or other objects, as appropriate.

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## Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

In paragraph [0002] of the description, the Japanese language disclosure "poid" includes a typographical error, and should instead read "void."

In paragraph [0003] of the description, the Japanese language disclosure "teijuuteki" includes an error, and should instead read "teiryouteki."

In paragraph [0009] of the description, the Japanese language disclosure "chokkou suru" [go directly] includes a typographical error, and should instead read "chokkou suru" [orthogonal].

In paragraph [0020] of the description, the Japanese language disclosure "gashitsu ga teika wo boushi suru" is written using improper grammar, and should instead read "gashitsu no teika wo boushi suru."

In paragraph [0027] of the description, the Japanese language disclosure "chokkou suru" [go directly] includes a typographical error, and should instead read "chokkou suru" [orthogonal].

In paragraph [0044] of the description, the Japanese language disclosure "ittei-chi ijou" [constant value anomaly] includes a typographical error, and should instead read "ittei-chi ijou" [a constant value or higher].

In claim 2, the Japanese language disclosure "chokkou suru" [go directly] includes a typographical error, and should instead read "chokkou suru" [orthogonal].

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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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## Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

With regards to claims 1 to 19, the description does not fully support whether it is possible to mask the unnecessary parts of the image and/or correct the brightness of the image by multiplying [the three dimensional imaging data] by factors that are somehow associated with the inspection position coordinates.

Claim 9 discloses the feature of "automatically calculating the volume of the abnormal site, and then determining whether or not the surface area of the aforementioned abnormal site exceeds a prescribed value." Therein, it is unclear whether the volume is calculated or the surface area is calculated.